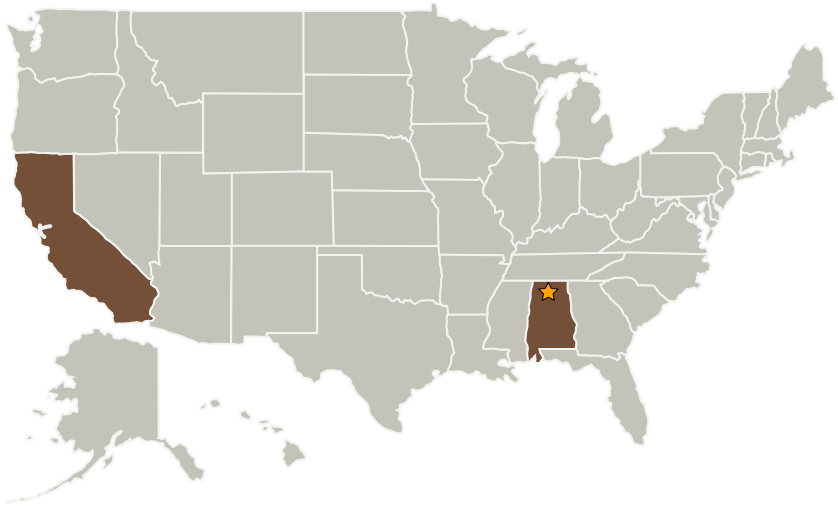
Real-time Multispecies Spacecraft Air Quality Monitor, Phase I

Completed Technology Project (2004 - 2004)

Project Introduction

This Small Business Innovative Research Phase I proposal seeks to develop an ultrasensitive, multispecies sensor system for use in determining the efficacy of air revitalization systems in space vehicle environments such as the International Space Station (ISS). The proposed instrument will be capable of determining absolute concentrations of numerous target molecules in real time, including CO2, CH4, H2O, NH3, and CO. Aside from CO and NH3, these species will be monitored with a precision and accuracy of 0.1% for commonly encountered levels. The detection limits (S/N=2) for CO and NH3 will be 50 and 5 ppbv, respectively. This compact, lightweight instrument will be capable of long-term unattended operation, and require minimal power. The Phase I research will demonstrate the feasibility of the technology by performing measurements on priority targets using a bench-scale laboratory instrument that employs a single, frequency agile laser source. The results of these tests will be used to quantify detection limits for a Phase II instrument that will employ a multiplexed diode-laser configuration. The proposed system will be capable of rapidly detecting numerous species with high precision and specificity. Commercial systems based on the Phase II prototype will be developed and marketed during Phase III.

Primary U.S. Work Locations and Key Partners



Real-time Multispecies Spacecraft Air Quality Monitor, Phase I

Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Marshall Space Flight Center (MSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Real-time Multispecies Spacecraft Air Quality Monitor, Phase I

Completed Technology Project (2004 - 2004)

Organizations Performing Work	Role	Type	Location
★Marshall Space Flight Center(MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
Novawave Technologies	Supporting Organization	Industry	Redwood City, California

Primary U.S. Work Locations	
Alabama	California

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Joshua Paul

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.3 Mechanical Systems
    - TX12.3.5 Certification Methods